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“Personality and All-Cause Mortality: Individual-Participant Meta-Analysis of 3,947 Deaths in 76,150 Adults” by Jokela, Batty, Nyberg, Virtanen, Nabi, Singh-Manoux, and Kivimäki

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We join Chapman (1) in acknowledging the importance of Jokela et al.'s recently published paper (2). The study of personality trait predictors of mortality is consequential and, with this study, it is clear that low conscientiousness deserves a seat at the table with major risk factors of early death. Jokela et al. accomplished this via an individual participant meta-analysis of seven cohorts to follow up on Friedman and others' (3) work that revealed the importance of low conscientiousness as a risk factor. We expect that this paper will be oft cited and that this statistical approach will be used in similar future studies.

However, we depart from the authors' conclusion that "... the present results [of their study] suggest that low conscientiousness is the only higher-order personality trait of the five-factor model that predicts higher mortality risk across populations." (p. 673). This generalization is overly broad, premature, and not tenable given two limitations of their study.

The first limitation is that while the combined sample size of Jokela et al.'s study was large ($N = 76,150$), in proportional hazards analysis, power is not determined by the number of participants, but by the number of events (4, 5). In light of this, compared to some previous studies (e.g., 6, 7), the British Household Panel Survey, Household, Income and Labour Dynamics in Australia Survey, and the Survey of Midlife Development in the United States all had low power. This problem with power is further illustrated by the fact that, despite their assertion that "...low conscientiousness is the only higher-order personality trait of the five-factor model that predicts higher mortality risk across populations." (p. 673), conscientiousness effects were not significant in the Household, Income and Labour Dynamics in Australia Survey and the Survey of Midlife Development in the United States, just identified as lower in power than other studies, and in the Wisconsin Longitudinal Study

sibling sample, which had the next lowest power (see figure 1 in ref 2). Clearly, the total number of deaths is a key determinant of a studies findings or lack thereof.

This limitation is not ameliorated by Jokela et al.'s data analytic approach or by any other that we are aware of. As pointed out by Munafò and colleagues (8); "Meta-analysis, while valuable and offering the potential to generate new hypotheses, is not a replacement for adequately powered primary studies." (p. 278).

The second limitation is the inadequate measurement of personality, which could seriously compromise the scales' predictive validities (9). The seven studies used several different very brief scales to measure the five higher-order factors likely resulting in content and construct deficiency of their putative personality factors. As a result, the authors may not have found consistent results for factors other than conscientiousness because these factors were not adequately measured.

Unfortunately, the authors present no evidence regarding the construct validity, i.e. high positive correlations between the different brief scales. Thus, as in other studies (8-11), the inconsistent findings displayed in Figure 1 (2) could reflect this limitation of their study. In short, very little confidence can be given to their conclusions that only conscientiousness is the only important personality predictor.

None of this is to say that we do not admire the researchers' efforts or appreciate the importance of their findings concerning conscientiousness. However, well-powered primary studies with valid measures of all the five factors may identify other important predictors of

mortality and thus we think it is too soon to ‘close the door’ on other personality factors as important predictors of mortality.

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